



SEQUENCE LISTING

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<120> NPC1L1 (NPC3) AND METHODS OF USE THEREOF

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Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu	
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Leu Ser Leu Glu Ser Ser Met Ser Ile Thr Lys Ala Leu Leu Thr Arg	
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Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Glu	
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Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Glu Ala Leu	
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Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ser Phe His Asp Glu His	
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Ser Gly Ile Leu Ser Leu Asp Phe Leu Leu Glu Leu Leu Glu Leu Gln	
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Tyr Asn Thr	
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Asn	Arg	Thr	Leu	Leu	Met	Leu	Thr	Ala	Asn	Gln	Thr	Leu	Asn	Gly	Gln		
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Thr	Ser	Leu	Val	Asp	Trp	Lys	Asp	His	Phe	Leu	Tyr	Cys	Ala	Asn	Ala		
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Pro	Leu	Thr	Phe	Lys	Asp	Gly	Thr	Ser	Leu	Ala	Leu	Ser	Cys	Met	Ala		
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Asp	Tyr	Gly	Ala	Pro	Val	Phe	Pro	Phe	Leu	Ala	Val	Gly	Gly	Tyr	Gln		
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Gly	Thr	Asp	Tyr	Ser	Glu	Ala	Glu	Ala	Leu	Ile	Ile	Thr	Phe	Ser	Leu		
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Arg	Gln	Glu	Ala	Ser	Arg	Pro	Asp	Val	Leu	Cys	Cys	Phe	Ser	Thr	Arg	
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Lys	Leu	Pro	Pro	Pro	Lys	Glu	Lys	Glu	Gly	Leu	Leu	Leu	Arg	Phe	Phe	
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Val	Met	Leu	Leu	Phe	Leu	Thr	Leu	Phe	Gly	Ala	Asn	Leu	Tyr	Leu	Met	
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Gly	Pro	Pro	Val	Tyr	Phe	Val	Thr	Thr	Ser	Gly	Phe	Asn	Phe	Ser	Ser	
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gag	gca	ggc	atg	aac	gcc	act	tgc	tct	agc	gca	ggc	tgt	aag	agc	ttc	2784
Glu	Ala	Gly	Met	Asn	Ala	Thr	Cys	Ser	Ser	Ala	Gly	Cys	Lys	Ser	Phe	
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Tyr	Val	Ala	Ile	Ala	Ala	Ser	Ser	Trp	Val	Asp	Asp	Phe	Ile	Asp	Trp	
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ctg	acc	ccg	tcc	tcc	tcc	tgc	tgt	cgc	ctt	tat	ata	cgt	ggc	ccc	cat	2928
Leu	Thr	Pro	Ser	Ser	Ser	Cys	Cys	Arg	Leu	Tyr	Ile	Arg	Gly	Pro	His	
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aac tgc atg aac cgc act ctg ggt cct gtg agg ccc aca gcg gaa cag	3024
Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Ala Glu Gln	
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Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn Ile	
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Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn	
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Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly	
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35 40 45

Thr Ser Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg His  
50 55 60

Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu  
65 70 75 80

Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu  
85 90 95

Leu Ser Leu Glu Ser Ser Met Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110

Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr  
115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Glu  
130 135 140

Arg Gly Ala Gly Glu Pro Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
145 150 155 160

Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg  
165 170 175

Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr  
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
195 200 205

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210 215 220

Pro Gly Gln Ala Leu Pro Asp Gly Ile Gln Pro Leu Asn Gly Lys Ile  
225 230 235 240

Ala Pro Cys Asn Glu Ser Gln Gly Asp Asp Ser Ala Val Cys Ser Cys  
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Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Glu Ala Leu  
260 265 270

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Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Ala Val Leu Val Arg

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Leu	Thr	Val	Leu	Ala	Leu	Ser	Phe	Ile	Val	Val	Ile	Ala	Leu	Ala	Ala	
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Gly	Leu	Thr	Phe	Ile	Glu	Leu	Thr	Thr	Asp	Pro	Val	Glu	Leu	Trp	Ser	
	370					375					380					
Ala	Pro	Lys	Ser	Gln	Ala	Arg	Lys	Glu	Lys	Ser	Phe	His	Asp	Glu	His	
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Arg	Ser	Ser	Tyr	Lys	Tyr	Asp	Ser	Leu	Leu	Leu	Gly	Ser	Lys	Asn	Phe	
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Ser	Gly	Ile	Leu	Ser	Leu	Asp	Phe	Leu	Leu	Glu	Leu	Leu	Glu	Leu	Gln	
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Glu	Arg	Leu	Arg	His	Leu	Gln	Val	Trp	Ser	Pro	Glu	Ala	Glu	Arg	Asn	
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Asp Lys Phe Gln Val Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu  
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Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Val Ser Tyr  
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Ile Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg  
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Cys Ser Arg Val Ala Val Glu Ser Lys Ala Thr Leu Gly Leu Gly Gly  
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Val Ile Val Val Leu Gly Ala Val Leu Ala Ala Met Gly Phe Tyr Ser  
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Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe  
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Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
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Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile  
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Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
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Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala  
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Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Leu Asp Phe  
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Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys  
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Arg Gln Glu Ala Ser Arg Pro Asp Val Leu Cys Cys Phe Ser Thr Arg  
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Lys Leu Pro Pro Pro Lys Glu Lys Glu Gly Leu Leu Leu Arg Phe Phe  
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Arg Lys Ile Tyr Ala Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val  
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Val Met Leu Leu Phe Leu Thr Leu Phe Gly Ala Asn Leu Tyr Leu Met  
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Cys Asn Ile Asn Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp  
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val  
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Glu Ala Gly Met Asn Ala Thr Cys Ser Ser Ala Gly Cys Lys Ser Phe  
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Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp  
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Leu Thr Pro Ser Ser Ser Cys Cys Arg Leu Tyr Ile Arg Gly Pro His  
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Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys  
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Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Ala Glu Gln  
 995 1000 1005

Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn Ile  
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Val	Pro	Gly	Thr	Asp	Pro	Asn	Phe	Glu	Val	Phe	Pro	Tyr	Thr	Ile
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Met	Thr	Asn	Phe	Pro	Gly	Ile	Leu	Ile	Leu	Gly	Phe	Ala	Gln	Ala
1220						1225					1230			
Gln	Leu	Ile	Gln	Ile	Phe	Phe	Phe	Arg	Leu	Asn	Leu	Leu	Ile	Thr
1235						1240					1245			
Leu	Leu	Gly	Leu	Leu	His	Gly	Leu	Val	Phe	Leu	Pro	Val	Val	Leu

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Ser Tyr Leu Gly Pro Asp Val Asn Gln Ala Leu Val Gln Glu Glu				
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Lys Leu Ala Ser Glu Ala Ala Val Ala Pro Glu Pro Ser Cys Pro				
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Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly				
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Phe Ala Pro Glu Leu Ala His Gly Ala Asn Ala Ala Arg Ser Ser				
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Leu Pro Lys Ser Asp Gln Lys Phe				
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cgc ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac	96
Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr	
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tgc gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc	144
Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser	
35 40 45	
ctc atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc	192
Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg	
50 55 60	
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Lys 65	Ile	Thr	Gly	Asp	His 70	Leu	Ile	Leu	Leu	Gln 75	Lys	Ile	Cys	Pro	Arg 80	
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Leu	Tyr	Thr	Gly	Pro	Asn	Thr	Gln	Ala	Cys	Cys	Ser	Ala	Lys	Gln	Leu	
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gta	tca	ctg	gaa	gcg	agt	ctg	tcg	atc	acc	aag	gcc	ctc	ctc	acc	cgc	336
Val	Ser	Leu	Glu	Ala	Ser	Leu	Ser	Ile	Thr	Lys	Ala	Leu	Leu	Thr	Arg	
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tgc	cca	gcc	tgc	tct	gac	aat	ttt	gtg	aac	ctg	cac	tgc	cac	aac	acg	384
Cys	Pro	Ala	Cys	Ser	Asp	Asn	Phe	Val	Asn	Leu	His	Cys	His	Asn	Thr	
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tgc	agc	ccc	aat	cag	agc	ctc	ttc	atc	aat	gtg	acc	cgc	gtg	gcc	cag	432
Cys	Ser	Pro	Asn	Gln	Ser	Leu	Phe	Ile	Asn	Val	Thr	Arg	Val	Ala	Gln	
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cta	ggg	gct	gga	caa	ctc	cca	gct	gtg	gtg	gcc	tat	gag	gcc	ttc	tac	480
Leu	Gly	Ala	Gly	Gln	Leu	Pro	Ala	Val	Val	Ala	Tyr	Glu	Ala	Phe	Tyr	
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cag	cat	agc	ttt	gcc	gag	cag	agc	tat	gac	tcc	tgc	agc	cgt	gtg	cgc	528
Gln	His	Ser	Phe	Ala	Glu	Gln	Ser	Tyr	Asp	Ser	Cys	Ser	Arg	Val	Arg	
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gtc	cct	gca	gct	gcc	acg	ctg	gct	gtg	ggc	acc	atg	tgt	ggc	gtg	tat	576
Val	Pro	Ala	Ala	Ala	Thr	Leu	Ala	Val	Gly	Thr	Met	Cys	Gly	Val	Tyr	
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Gly	Ser	Ala	Leu	Cys	Asn	Ala	Gln	Arg	Trp	Leu	Asn	Phe	Gln	Gly	Asp	
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Thr	Gly	Asn	Gly	Leu	Ala	Pro	Leu	Asp	Ile	Thr	Phe	His	Leu	Leu	Glu	
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cct	ggc	cag	gcc	gtg	ggg	agt	ggg	att	cag	cct	ctg	aat	gag	ggg	gtt	720
Pro	Gly	Gln	Ala	Val	Gly	Ser	Gly	Ile	Gln	Pro	Leu	Asn	Glu	Gly	Val	
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Ala	Arg	Cys	Asn	Glu	Ser	Gln	Gly	Asp	Asp	Val	Ala	Thr	Cys	Ser	Cys	
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Gln	Asp	Cys	Ala	Ala	Ser	Cys	Pro	Ala	Ile	Ala	Arg	Pro	Gln	Ala	Leu	
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Asp	Ser	Thr	Phe	Tyr	Leu	Gly	Gln	Met	Pro	Gly	Ser	Leu	Val	Leu	Ile	
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atc	atc	ctc	tgc	tct	gtc	ttc	gct	gtg	gtc	acc	atc	ctg	ctt	gtg	gga	912
Ile	Ile	Leu	Cys	Ser	Val	Phe	Ala	Val	Val	Thr	Ile	Leu	Leu	Val	Gly	
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Phe	Arg	Val	Ala	Pro	Ala	Arg	Asp	Lys	Ser	Lys	Met	Val	Asp	Pro	Lys	

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aag ggc acc agc ctc tct gac aag ctc agc ttc tcc acc cac acc ctc				1008
Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu	325	330	335	
ctt ggc cag ttc ttc cag ggc tgg ggc acg tgg gtg gct tcg tgg cct				1056
Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro	340	345	350	
ctg acc atc ttg gtg cta tct gtc atc ccg gtg gtg gcc ttg gca gcg				1104
Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala	355	360	365	
ggc ctg gtc ttt aca gaa ctc act acg gac ccc gtg gag ctg tgg tcg				1152
Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser	370	375	380	
gcc ccc aac agc caa gcc cgg agt gag aaa gct ttc cat gac cag cat				1200
Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His	385	390	395	400
ttc ggc ccc ttc ttc cga acc aac cag gtg atc ctg acg gct cct aac				1248
Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn	405	410	415	
cgg tcc agc tac agg tat gac tct ctg ctg ctg ggg ccc aag aac ttc				1296
Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe	420	425	430	
agc gga atc ctg gac ctg gac ttg ctg ctg gag ctg cta gag ctg cag				1344
Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln	435	440	445	
gag agg ctg cgg cac ctc cag gta tgg tcg ccc gaa gca cag cgc aac				1392
Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn	450	455	460	
atc tcc ctg cag gac atc tgc tac gcc ccc ctc aat ccg gac aat acc				1440
Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr	465	470	475	480
agt ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac				1488
Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn	485	490	495	
aac cgc acg ctc ctg ctg ctc aca gcc aac cag aca ctg atg ggg cag				1536
Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln	500	505	510	
acc tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc				1584
Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala	515	520	525	
ccg ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct				1632
Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala	530	535	540	
gac tac ggg gcc cct gtc ttc ccc ttc ctt gcc att ggg ggg tac aaa				1680
Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys	545	550	555	560

gga aag gac tat tct gag gca gag gcc ctg atc atg acg ttc tcc ctc Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu 565 570 575	1728
aac aat tac cct gcc ggg gac ccc cgt ctg gcc cag gcc aag ctg tgg Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp 580 585 590	1776
gag gag gcc ttc tta gag gaa atg cga gcc ttc cag cgt cgg atg gct Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala 595 600 605	1824
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att gtc ata ttc ctg tac atc tct ctg gcc ctg ggc agc tat tcc agc Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser 645 650 655	1968
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tct gag gcc atc tgc ttc ttc cta ggg gcc ctg acc ccc atg cca gct Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala 755 760 765	2304
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Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln	
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Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe	
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Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val	
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Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met	
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Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp	
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Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val	
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Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser	
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Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe	
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Thr	Asn	Leu	Pro	Gly	Ile	Leu	Val	Leu	Gly	Leu	Ala	Lys	Ala	Gln	
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ctc	att	cag	atc	ttc	ttc	ttc	cgc	ctc	aac	ctc	ctg	atc	act	ctg	3744
Leu	Ile	Gln	Ile	Phe	Phe	Phe	Arg	Leu	Asn	Leu	Leu	Ile	Thr	Leu	
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Leu	Gly	Leu	Leu	His	Gly	Leu	Val	Phe	Leu	Pro	Val	Ile	Leu	Ser	
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tac	gtg	ggg	cct	gac	gtt	aac	ccg	gct	ctg	gca	ctg	gag	cag	aag	3834
Tyr	Val	Gly	Pro	Asp	Val	Asn	Pro	Ala	Leu	Ala	Leu	Glu	Gln	Lys	



Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln  
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Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
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Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg  
165 170 175

Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr  
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
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Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
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Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val  
225 230 235 240

Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys  
245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu  
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Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile  
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Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly  
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Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys  
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Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu  
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Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala  
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Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser  
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Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His  
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Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn  
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Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe  
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Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln  
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Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn  
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr  
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Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
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Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln  
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Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala  
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Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala  
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Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys  
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Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu  
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Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
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Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe  
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Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val  
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Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met

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Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe				
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Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser				
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Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp				
945		950		955
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Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys				
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Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe				
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His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys				
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Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu				
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Lys Pro Leu Lys Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala				
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Ala Arg Glu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val				
	1070		1075	1080
Pro Gly Thr Asp Pro Ala Phe Glu Val Phe Pro Tyr Thr Ile Thr				
	1085		1090	1095

Asn Val	Phe Tyr Glu Gln Tyr	Leu Thr Ile Leu Pro	Glu Gly Leu
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Phe Met	Leu Ser Leu Cys Leu	Val Pro Thr Phe Ala	Val Ser Cys
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Ser Ile	Val Met Ile Leu Val	Asp Thr Val Gly Phe	Met Ala Leu
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Trp Asp	Ile Ser Tyr Asn Ala	Val Ser Leu Ile Asn	Leu Val Ser
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Arg Ala	Glu Glu Ala Val Ala	Ala Val Met Val Ala	Ser Cys Pro
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<211> 885

<212> DNA

<213> Rattus sp.

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<212> DNA

<213> Rattus sp.

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<211> 896

<212> DNA

<213> Rattus sp.

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<211> 3124

<212> DNA

<213> Rattus sp.

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<211> 4484

<212> DNA

<213> Rattus sp.

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<220>

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<213> Mus sp.

<220>

<221> CDS

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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu	
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Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu	
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Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln	
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885 890 895	
ggg cct cca gtg tac ttt gac acc acc tca ggc tac aac ttt tcc acc	2736

Gly	Pro	Pro	Val	Tyr	Phe	Asp	Thr	Thr	Ser	Gly	Tyr	Asn	Phe	Ser	Thr		
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gag	gca	ggc	atg	aac	gcc	att	tgc	tct	agt	gca	ggc	tgt	gag	agc	ttc	2784	
Glu	Ala	Gly	Met	Asn	Ala	Ile	Cys	Ser	Ser	Ala	Gly	Cys	Glu	Ser	Phe		
		915					920					925					
tcc	cta	acc	cag	aaa	atc	cag	tat	gcc	agt	gaa	ttc	cct	aat	cag	tct	2832	
Ser	Leu	Thr	Gln	Lys	Ile	Gln	Tyr	Ala	Ser	Glu	Phe	Pro	Asn	Gln	Ser		
	930					935					940						
tat	gtg	gct	att	gct	gca	tcc	tcc	tgg	gta	gat	gac	ttc	atc	gac	tgg	2880	
Tyr	Val	Ala	Ile	Ala	Ala	Ser	Ser	Trp	Val	Asp	Asp	Phe	Ile	Asp	Trp		
945					950					955					960		
ctg	acc	cca	tcc	tcc	tcc	tgc	tgc	cgc	att	tat	acc	cgt	ggc	ccc	cat	2928	
Leu	Thr	Pro	Ser	Ser	Ser	Cys	Cys	Arg	Ile	Tyr	Thr	Arg	Gly	Pro	His		
				965				970						975			
aaa	gat	gag	ttc	tgt	ccc	tca	acg	gat	act	tcc	ttc	aac	tgt	ctc	aaa	2976	
Lys	Asp	Glu	Phe	Cys	Pro	Ser	Thr	Asp	Thr	Ser	Phe	Asn	Cys	Leu	Lys		
			980					985					990				
aac	tgc	atg	aac	cgc	act	ctg	ggc	ccc	gtg	aga	ccc	aca	aca	gaa	cag	3024	
Asn	Cys	Met	Asn	Arg	Thr	Leu	Gly	Pro	Val	Arg	Pro	Thr	Thr	Glu	Gln		
		995					1000					1005					
ttt	cat	aag	tac	ctg	ccc	tgg	ttc	ctg	aat	gat	acg	ccc	aac	atc		3069	
Phe	His	Lys	Tyr	Leu	Pro	Trp	Phe	Leu	Asn	Asp	Thr	Pro	Asn	Ile			
	1010					1015					1020						
aga	tgt	cct	aaa	ggg	ggc	cta	gca	gcg	tat	aga	acc	tct	gtg	aat		3114	
Arg	Cys	Pro	Lys	Gly	Gly	Leu	Ala	Ala	Tyr	Arg	Thr	Ser	Val	Asn			
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ttg	agc	tca	gat	ggc	cag	att	ata	gcc	tcc	cag	ttc	atg	gcc	tac		3159	
Leu	Ser	Ser	Asp	Gly	Gln	Ile	Ile	Ala	Ser	Gln	Phe	Met	Ala	Tyr			
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cac	aag	ccc	tta	cgg	aac	tca	cag	gac	ttt	aca	gaa	gct	ctc	cgg		3204	
His	Lys	Pro	Leu	Arg	Asn	Ser	Gln	Asp	Phe	Thr	Glu	Ala	Leu	Arg			
	1055					1060					1065						
gca	tcc	cgg	ttg	cta	gca	gcc	aac	atc	aca	gct	gaa	cta	cgg	aag		3249	
Ala	Ser	Arg	Leu	Leu	Ala	Ala	Asn	Ile	Thr	Ala	Glu	Leu	Arg	Lys			
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gtg	cct	ggg	aca	gat	ccc	aac	ttt	gag	gtc	ttc	cct	tac	acg	atc		3294	
Val	Pro	Gly	Thr	Asp	Pro	Asn	Phe	Glu	Val	Phe	Pro	Tyr	Thr	Ile			
	1085					1090					1095						
tcc	aat	gtg	ttc	tac	cag	caa	tac	ctg	acg	gtt	ctc	cct	gag	gga		3339	
Ser	Asn	Val	Phe	Tyr	Gln	Gln	Tyr	Leu	Thr	Val	Leu	Pro	Glu	Gly			
	1100					1105					1110						
atc	ttc	act	ctt	gct	ctc	tgc	ttc	gtg	ccc	acc	ttt	gtg	gtc	tgc		3384	
Ile	Phe	Thr	Leu	Ala	Leu	Cys	Phe	Val	Pro	Thr	Phe	Val	Val	Cys			
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tac	ctc	cta	ctg	ggc	ctg	gac	ata	cgc	tca	ggc	atc	ctc	aac	ctg		3429	
Tyr	Leu	Leu	Leu	Gly	Leu	Asp	Ile	Arg	Ser	Gly	Ile	Leu	Asn	Leu			

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gtg tgg ggt atc agc tac Val Trp Gly Ile Ser Tyr 1160	aat gct gtg tcc ctc Asn Ala Val Ser Leu 1165	atc aac ctt gtc Ile Asn Leu Val 1170	3519
acg gca gtg ggc atg tct Thr Ala Val Gly Met Ser 1175	gtg gag ttc gtg tcc Val Glu Phe Val Ser 1180	cac att acc cgg His Ile Thr Arg 1185	3564
tcc ttt gct gta agc acc Ser Phe Ala Val Ser Thr 1190	aag cct acc cgg ctg Lys Pro Thr Arg Leu 1195	gag aga gcc aaa Glu Arg Ala Lys 1200	3609
gat gct act atc ttc atg Asp Ala Thr Ile Phe Met 1205	ggc agt gcg gtg ttt Gly Ser Ala Val Phe 1210	gct gga gtg gcc Ala Gly Val Ala 1215	3654
atg acc aac ttc ccg ggc Met Thr Asn Phe Pro Gly 1220	atc ctc atc ctg ggc Ile Leu Ile Leu Gly 1225	ttt gct cag gcc Phe Ala Gln Ala 1230	3699
cag ctt atc cag att ttc Gln Leu Ile Gln Ile Phe 1235	ttc ttc cgc ctc aac Phe Phe Arg Leu Asn 1240	ctc ctg atc acc Leu Leu Ile Thr 1245	3744
ttg ctg ggt ctg cta cac Leu Leu Gly Leu Leu His 1250	ggc ctg gtc ttc ctg Gly Leu Val Phe Leu 1255	ccc gtt gtc ctc Pro Val Val Leu 1260	3789
agc tat ctg ggg cca gat Ser Tyr Leu Gly Pro Asp 1265	gtt aac caa gct ctg Val Asn Gln Ala Leu 1270	gta ctg gag gag Val Leu Glu Glu 1275	3834
aaa cta gcc act gag gca Lys Leu Ala Thr Glu Ala 1280	gcc atg gtc tca gag Ala Met Val Ser Glu 1285	cct tct tgc cca Pro Ser Cys Pro 1290	3879
cag tac ccc ttc ccg gct Gln Tyr Pro Phe Pro Ala 1295	gat gca aac acc agt Asp Ala Asn Thr Ser 1300	gac tat gtt aac Asp Tyr Val Asn 1305	3924
tac ggc ttt aat cca gaa Tyr Gly Phe Asn Pro Glu 1310	ttt atc cct gaa att Phe Ile Pro Glu Ile 1315	aat gct gct agc Asn Ala Ala Ser 1320	3969
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Ser Ala Gln Gly Glu Leu Tyr Thr Pro Thr His Lys Ala Gly Phe Cys  
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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu  
35 40 45

Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His  
50 55 60

Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu  
65 70 75 80

Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu  
85 90 95

Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110

Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr  
115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln  
130 135 140

Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
145 150 155 160

Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg  
165 170 175

Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr  
180 185 190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
210 215 220

Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile  
 225 230 235 240

Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys  
 245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Pro Ala Leu  
 260 265 270

Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile  
 275 280 285

Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Val Val Leu Val Tyr  
 290 295 300

Leu Arg Val Ala Ser Asn Arg Asn Lys Asn Lys Thr Ala Gly Ser Gln  
 305 310 315 320

Glu Ala Pro Asn Leu Pro Arg Lys Arg Arg Phe Ser Pro His Thr Val  
 325 330 335

Leu Gly Arg Phe Phe Glu Ser Trp Gly Thr Arg Val Ala Ser Trp Pro  
 340 345 350

Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ser Val  
 355 360 365

Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser  
 370 375 380

Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ala Phe His Asp Glu His  
 385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Lys Asn  
 405 410 415

Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe  
 420 425 430

Ser Gly Ile Leu Ser Leu Asp Leu Leu Gln Glu Leu Leu Glu Leu Gln  
 435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser His Glu Ala Gln Arg Asn  
 450 455 460

Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr  
 465 470 475 480

Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
 485 490 495

Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln  
 500 505 510

Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala  
 515 520 525

Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala  
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Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln  
 545 550 555 560

Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile  
 565 570 575

Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala His Ala Lys Leu Trp  
 580 585 590

Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala  
 595 600 605

Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu  
 610 615 620

Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr  
 625 630 635 640

Leu Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg  
 645 650 655

Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly  
 660 665 670

Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser  
 675 680 685

Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe  
 690 695 700

Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu

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Tyr	Gln	Arg	Leu	Pro	Arg	Met	Pro	Gly	Glu	Gln	Arg	Glu	Ala	His	Ile
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Gly	Arg	Thr	Leu	Gly	Ser	Val	Ala	Pro	Ser	Met	Leu	Leu	Cys	Ser	Leu
			740					745					750		
Ser	Glu	Ala	Ile	Cys	Phe	Phe	Leu	Gly	Ala	Leu	Thr	Ser	Met	Pro	Ala
		755					760					765			
Val	Arg	Thr	Phe	Ala	Leu	Thr	Ser	Gly	Leu	Ala	Ile	Ile	Phe	Asp	Phe
	770					775					780				
Leu	Leu	Gln	Met	Thr	Ala	Phe	Val	Ala	Leu	Leu	Ser	Leu	Asp	Ser	Lys
785					790					795					800
Arg	Gln	Glu	Ala	Ser	Arg	Pro	Asp	Val	Val	Cys	Cys	Phe	Ser	Ser	Arg
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Asn	Leu	Pro	Pro	Pro	Lys	Gln	Lys	Glu	Gly	Leu	Leu	Leu	Cys	Phe	Phe
			820					825					830		
Arg	Lys	Ile	Tyr	Thr	Pro	Phe	Leu	Leu	His	Arg	Phe	Ile	Arg	Pro	Val
		835					840					845			
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865					870					875					880
Ser	Tyr	Leu	Ile	Asp	Tyr	Phe	Leu	Phe	Leu	Asn	Arg	Tyr	Leu	Glu	Val
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			900					905					910		
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		915					920					925			
Ser	Leu	Thr	Gln	Lys	Ile	Gln	Tyr	Ala	Ser	Glu	Phe	Pro	Asn	Gln	Ser
	930					935					940				
Tyr	Val	Ala	Ile	Ala	Ala	Ser	Ser	Trp	Val	Asp	Asp	Phe	Ile	Asp	Trp
945					950					955					960

Leu Thr Pro Ser Ser Ser Cys Cys Arg Ile Tyr Thr Arg Gly Pro His  
                   965                                  970                                  975

Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys  
                   980                                  985                                  990

Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Thr Glu Gln  
                   995                                  1000                                  1005

Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Thr Pro Asn Ile  
           1010                                  1015                                  1020

Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn  
           1025                                  1030                                  1035

Leu Ser Ser Asp Gly Gln Ile Ile Ala Ser Gln Phe Met Ala Tyr  
           1040                                  1045                                  1050

His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg  
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Ala Ser Arg Leu Leu Ala Ala Asn Ile Thr Ala Glu Leu Arg Lys  
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Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile  
           1085                                  1090                                  1095

Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly  
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Ile Phe Thr Leu Ala Leu Cys Phe Val Pro Thr Phe Val Val Cys  
           1115                                  1120                                  1125

Tyr Leu Leu Leu Gly Leu Asp Ile Arg Ser Gly Ile Leu Asn Leu  
           1130                                  1135                                  1140

Leu Ser Ile Ile Met Ile Leu Val Asp Thr Ile Gly Leu Met Ala  
           1145                                  1150                                  1155

Val Trp Gly Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val  
           1160                                  1165                                  1170

Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg  
           1175                                  1180                                  1185

Ser Phe Ala Val Ser Thr Lys Pro Thr Arg Leu Glu Arg Ala Lys  
 1190 1195 1200

Asp Ala Thr Ile Phe Met Gly Ser Ala Val Phe Ala Gly Val Ala  
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Met Thr Asn Phe Pro Gly Ile Leu Ile Leu Gly Phe Ala Gln Ala  
 1220 1225 1230

Gln Leu Ile Gln Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr  
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Leu Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Val Leu  
 1250 1255 1260

Ser Tyr Leu Gly Pro Asp Val Asn Gln Ala Leu Val Leu Glu Glu  
 1265 1270 1275

Lys Leu Ala Thr Glu Ala Ala Met Val Ser Glu Pro Ser Cys Pro  
 1280 1285 1290

Gln Tyr Pro Phe Pro Ala Asp Ala Asn Thr Ser Asp Tyr Val Asn  
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Tyr Gly Phe Asn Pro Glu Phe Ile Pro Glu Ile Asn Ala Ala Ser  
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Ser Ser Leu Pro Lys Ser Asp Gln Lys Phe  
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ttymgnytna	ayytnytnat	hacnytnytn	ggnytnytn	aygnytngt	nttyytnccn	3780

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 gcnacngarg cngcnatggg nwsngarccn wsntgyccnc artayccntt yccngcngay 3900  
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Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Leu Arg  
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Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr Cys  
20 25 30

gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc ctc 203  
Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser Leu  
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Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg Lys  
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Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg Cys  
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115 120 125

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Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn Arg	
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Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Gly Pro Lys Asn Phe Ser	
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Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln Glu	
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Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn Ile	
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Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala Asp	
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Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys Gly	
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Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu Asn	
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Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Met Ala Gly	
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Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly Val	
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Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser Tyr	
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Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe Leu	
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Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu Tyr	
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Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile Gly	
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Thr Lys Pro Thr Trp Leu Glu Arg Ala Lys Glu Ala Thr Ile Ser					
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Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr Leu Leu Gly Leu Leu					
1265		1270		1275	
cat ggc ttg gtc ttc ctg ccc gtc atc ctc agc tac gtg ggg cct					3938
His Gly Leu Val Phe Leu Pro Val Ile Leu Ser Tyr Val Gly Pro					
1280		1285		1290	
gac gtt aac ccg gct ctg gca ctg gag cag aag cgg gct gag gag					3983
Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys Arg Ala Glu Glu					
1295		1300		1305	
gcg gtg gca gca gtc atg gtg gcc tct tgc cca aat cac ccc tcc					4028
Ala Val Ala Ala Val Met Val Ala Ser Cys Pro Asn His Pro Ser					
1310		1315		1320	
cga gtc tcc aca gct gac aac atc tat gtc aac cac agc ttt gaa					4073
Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn His Ser Phe Glu					
1325		1330		1335	

ggt tct atc aaa ggt gct ggt gcc atc agc aac ttc ttg ccc aac 4118  
 Gly Ser Ile Lys Gly Ala Gly Ala Ile Ser Asn Phe Leu Pro Asn  
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 Asn Gly Arg Gln Phe  
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<212> PRT

<213> Homo sapiens

<400> 44

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Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser  
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 Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
 100 105 110  
 Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr  
 115 120 125  
 Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln  
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 145 150 155 160  
 Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg  
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 Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr  
 180 185 190  
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 Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val  
 225 230 235 240  
 Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys  
 245 250 255  
 Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu  
 260 265 270

Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile  
 275 280 285

Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly  
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Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys  
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Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu  
 325 330 335

Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro  
 340 345 350

Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala  
 355 360 365

Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser  
 370 375 380

Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His  
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Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn  
 405 410 415

Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe  
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Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln  
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr  
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Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
 485 490 495

Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln  
 500 505 510

Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala

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Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys				
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Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp				
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Gly Met Phe Gln Val Thr Phe Met Ala Glu Arg Ser Leu Glu Asp Glu				
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Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr				
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Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly				
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Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser				
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Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe				
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Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu				
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				715
				720
Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile				
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Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu				
		740		745
				750
Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala				
		755		760
				765

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785 790 795 800  
Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln  
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Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe  
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Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val  
835 840 845  
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850 855 860  
Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp  
865 870 875 880  
Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val  
885 890 895  
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Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser  
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945 950 955 960  
Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys  
965 970 975  
Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn  
980 985 990  
Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe  
995 1000 1005

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Cys	Pro	Lys	Gly	Gly	Leu	Ala	Ala	Tyr	Ser	Thr	Ser	Val	Asn	Leu
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Thr	Ser	Asp	Gly	Gln	Val	Leu	Asp	Thr	Val	Ala	Ile	Leu	Ser	Pro
1040						1045					1050			
Arg	Leu	Glu	Tyr	Ser	Gly	Thr	Ile	Ser	Ala	His	Cys	Asn	Leu	Tyr
1055						1060					1065			
Leu	Leu	Asp	Ser	Ala	Ser	Arg	Phe	Met	Ala	Tyr	His	Lys	Pro	Leu
1070						1075					1080			
Lys	Asn	Ser	Gln	Asp	Tyr	Thr	Glu	Ala	Leu	Arg	Ala	Ala	Arg	Glu
1085						1090					1095			
Leu	Ala	Ala	Asn	Ile	Thr	Ala	Asp	Leu	Arg	Lys	Val	Pro	Gly	Thr
1100						1105					1110			
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1130						1135					1140			
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1145						1150					1155			
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Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr Leu Leu Gly Leu  
1265 1270 1275

Leu His Gly Leu Val Phe Leu Pro Val Ile Leu Ser Tyr Val Gly  
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Pro Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys Arg Ala Glu  
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1310 1315 1320

Ser Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn His Ser Phe  
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Asn Asn Gly Arg Gln Phe  
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<212> DNA

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25

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<223> primer

<400> 47  
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25

<210> 48

<211> 25

<212> DNA

<213> Artificial sequence

<220>

<223> primer

<400> 48

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25

<210> 49

<211> 28

<212> DNA

<213> Artificial sequence

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<223> primer

<400> 49

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28

<210> 50

<211> 25

<212> DNA

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<223> primer

<400> 50

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